What is claimed is:

1. A method for manufacturing MTJ cell of magnetic random access memory (MRAM) comprising:

forming a stacked structure of a pinned magnetic layer, an alumina layer and a free magnetic layer;

forming a hard mask layer on the stacked structure;

patterning the hard mask layer via a photoetching process using a MTJ cell mask to form a hard mask layer pattern exposing a portion of the free magnetic layer;

subjecting the exposed portion of the free magnetic layer to a halo ion implant process;

oxidizing the exposed portion of the free magnetic layer; and

patterning a MTJ cell by etching the stacked structure.

2. The method according to claim 1, wherein the halo ion implant process is performed in a manner that a tilt angle ranges from 0 to 90° and a ion is implanted from four directions.